

**REMARKS**

**I. CLAIM STATUS**

Claims 39, 43-53, 55-58, 77 are pending after this amendment. Specifically, claim 39 has been amended to incorporate claims 40-42 and to remove the proviso that the emulsifier may not be an alkoxyated alkyl phenol. Claim 77 has been added to recite that the affirmative step of reducing pollution in the form of particulates. Section 112 support for these amendments may be found in the specification-as-filed, including, for example, the original claims and pages 7, 10, and 17 disclosing the reduction of particulate emissions by use of this fuel emulsion. Accordingly, no new matter has been added by this amendment. Applicants have also cancelled claims 59-76 without prejudice or disclaimer, with the right to file a continuation application directed to the cancelled subject matter.

Applicants thank the Office for withdrawing the rejection of claims 39, 43, 44, 47-49, 51-59, 63, 64, and 66-76 under 35 U.S.C. §103(a) over DE 100 03 105 to Huffer et al. ("Huffer"); claims 59-69, 72, and 73 under 35 U.S.C. §102(b) over EP-A-0 399 620 to Genova et al. ("Genova I"); claims 59-69, 72, and 73 under 35 U.S.C. §102(b) over US Patent No. 5,004,479 to Schon et al. ("Schon"); claims 59-64, 66, 69, 72, and 73 under 35 U.S.C. §102(b) over EP-A-0 441 002 to Genova et al. ("Genova II"); and claims 40-42, 45, 46, and 50 under 35 U.S.C. §103(a) over Huffer in view of US Patent No. 6,598, 584 to Beck et al. ("Beck").

**II. Section 112 rejection**

The Office rejects claims 39-53 and 55-76 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement for the reasons provided at page 2 of the Office Action.

Applicants respectfully disagree, particularly in view of the material, such as WO 97/34969, that has been incorporated by reference into the specification at page 13. However, without acquiescing to the rejection and solely to advance prosecution, Applicants amend claim 39 to remove the proviso that the emulsifier may not be an alkoxylated alkyl phenol. Applicants note that none of the prior rejections were withdrawn in view of this proviso.

Thus, the rejection is moot and Applicants respectfully request the withdrawal of the Section 112, first paragraph rejection.

**III. Rejections Under 35 U.S.C. § 103(A)**

**A. Ford**

The Office has rejected claims 39, 43, 44, 47-49, 51-53, 57-59, 63, 64, and 66-76 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 3,756,794 to Ford ("Ford") for the reasons provided in the Office Action at pp. 2-3. Applicants traverse for the following reasons.

Several basic factual inquiries must be made in order to determine the obviousness or non-obviousness of claims of a patent application under 35 U.S.C. § 103. These factual inquiries, set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459, 467 (1966), require the Examiner to:

- (1) Determine the scope and content of the prior art;
- (2) Ascertain the differences between the prior art and the claims in issue;
- (3) Resolve the level of ordinary skill in the pertinent art; and
- (4) Evaluate evidence of secondary considerations.

The obviousness or nonobviousness of the claimed invention is then evaluated in view of the results of these inquiries. *Graham*, 383 U.S. at 17-18, 148 U.S.P.Q. 467; *see also KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1730, 82 U.S.P.Q.2d 1385, 1388 (2007).

Applicants submit that Ford does not teach or suggest the claimed invention. Specifically, Ford does not teach or suggest “operating the internal combustion engine so as to reduce peak combustion temperature in the at least one combustion chamber” and in particular, Ford does not teach or suggest doing so with a method selected from: i) recirculating a portion of exhaust gases produced during ignition into the at least one combustion chamber, ii) controlling injection timing of the fuel emulsion in the combustion chamber, or iii) compressing and cooling intake air before entering the combustion chamber, as previously recited in claims 40-42.

The Office has conceded as much by not rejecting claims 40-42 over Ford alone. Accordingly, the current rejection should be withdrawn.

#### **B. Huffer in view of Ford**

The Office has rejected claims 39, 43, 44, 47-49, 51-53, 55-59, 63, 64, 66-76 under 35 U.S.C. §103(a) as being unpatentable over DE 100 03 105 to Huffer et al. (“Huffer”) in view of Ford for the reasons provided in the Office Action at pp. 3-4. Applicants traverse for the following reasons.

Applicants submit that Huffer does not teach or suggest the claimed invention. Specifically, Huffer does not teach or suggest a method comprising “operating the internal combustion engine so as to reduce peak combustion temperature in the at least one combustion chamber” and in particular, Huffer does not teach or suggest doing so with a method selected from: i) recirculating a portion of exhaust gases produced during ignition into the at least one combustion chamber, ii) controlling injection timing of the fuel emulsion in the combustion chamber, or iii) compressing and cooling intake air before entering the combustion chamber, as previously recited in claims 40-42.

The Office has conceded as much by not rejecting claims 40-42 over Huffer in view of Ford. Accordingly, the current rejection should be withdrawn.

**C. Genova in view of Ford**

The Office has rejected claims 59-69, 72, and 73 under 35 U.S.C. §103(a)<sup>1</sup> as being unpatentable over EP-A-0 399 620 to Genova et al. in view of Ford for the reasons provided in the Office Action at p. 5. Since Applicants have canceled these claims, the rejection is moot and should be withdrawn.

**D. Schon in view of Ford**

The Office has rejected claims 59-69, 72, and 73 under 35 U.S.C. §103(a)<sup>2</sup> as being unpatentable over U.S. Patent No. 5,004,479 to Schon et al. in view of Ford for the reasons provided in the Office Action at p. 6. Since Applicants have canceled these claims, the rejection is moot and should be withdrawn.

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<sup>1</sup> The Office recites 102(b) in the Office Action but we believe the Office means 103(a) because of the use of two references and the use of the word “obvious” in the rejection.

<sup>2</sup> The Office recites 102(b) in the Office Action but we believe the Office means 103(a) because of the use of two references and the use of the word “obvious” in the rejection.

**E. Huffer in view of Ford, further in view of Beck**

The Office has rejected claims 40-42, 45, 46, and 50 under 35 U.S.C. §103(a) as being unpatentable over Huffer<sup>3</sup> in view of Ford and further in view of U.S. Patent No. 6,598,584 to Beck et al. ("Beck") for the reasons provided in the Office Action at p. 7. Applicants traverse for the following reasons.

First, contrary to the Office's argument on page 4 of the Office Action, there is no basis for the proposed substitution of glycols, polyols, ethers, or ketones for the alcohols of Huffer. The Examiner's first reasoning is that Applicant's specification taught that they were substitutable. Such reasoning, however, is the very definition of improper hindsight, which MAY NOT be the basis for an obviousness rejection. *See e.g.* M.P.E.P. § 2142 ("Knowledge of applicant's disclosure must be put aside in reaching this determination . . . .")

The Examiner's second reasoning to substitute with Ford's polyols and glycols because "they are art recognized alternatives, known for the same purpose" has no basis in the record. Applicants note that Huffer discloses the use of C<sub>1</sub>-C<sub>4</sub> alcohols, such as methanol, to broaden the temperature range over which the emulsion is stable. Huffer at ¶[0023]. In contrast, Ford teaches the use of polyols/glycols, such as ethylene glycol, as a anti-freezing agent. Ford, col. 2, lines 15-20. Neither Ford nor Huffer teach or suggest that polyols or glycols broaden the temperature range over which the emulsion is stable, like an alcohol. Rather, Ford merely teaches that its polyols/glycols

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<sup>3</sup> Applicants understand that U.S. Patent Appln Publ. 2003/0024852 A1 is an English-language application corresponding to DE 10003105 A1, and rely on its disclosure to respond to the current rejection. Thus, citations to Huffer refer to this U.S. publication.

can be substituted with ammonium salts. *Id.* Hence, there is no evidence of record for a person skilled in the art to believe that Ford's polyols or glycols could be substituted for alcohol in Huffer's compositions with a reasonable expectation of success that the temperature range will be broadened, as required by Huffer.

Thus, the proposed combination does not teach "the at least one oxygen-containing water soluble organic compound," as required by all of the claims.

Second, the present application has shown unexpected results with the claimed method for the reduction of pollutants, such as the reduction of particulates in Table 2 and as exemplified by claim 77. Table 2 show that the use of mono ethylene glycol (MEG) in 2% and 3%, in combination with the operation of an engine in which peak combustion temperature is reduced, reduces the amount of particulates by three times compared to fuel alone (example 1 versus examples 4-5) and two times compared to fuel/water emulsions (examples 2-3 versus examples 4-5). The unexpected superiority of the claimed invention over Ford/Huffer/Beck further establish the non-obviousness of the claims.

Third, as stated above, Huffer and Ford do not teach or suggest the claimed invention. In fact, the Office admits that Huffer in view of Ford does not teach employing EGR, controlling injection time, and compressing and cooling intake air. Office Action at p. 7. Applicants submit that Beck does not cure the deficiency.

The Office asserts that Beck teaches that it is old in the art to employ EGR, controlling injection time, and compressing and cooling intake air. *Id.* However, Applicants assert that whether or not these elements are "old in the art" is not a basis for obviousness. Even if these elements were old in the art, which Applicants do not

concede, the combination of these elements with other elements that they have not been previously combined with would render the invention novel. As explained by the Federal Circuit, “an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue.” *In re Rouffet*, 149 F.3d 1350, 1357, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). Here, the Office’s assertion that some of the claimed elements are “old in the art” does not negate that none of the references lead a person skilled in the art to reach the claimed invention with any reasonable expectation of success.

For example, Beck’s teachings are directed to a different system than either Ford or Huffer. Beck is directed towards a **gas** (as opposed to liquid) fueled compression ignition engine. Beck at Abstract, col. 1, lines 9-18. In contrast, Ford and Huffer are directed towards a **liquid** fuel **emulsion** fueled engines. Ford at Abstract; Huffer at Abstract. The Examiner has not shown that one skilled in the art would have expected any of the alleged benefits recited in Beck, which the Examiner has not even noted whether they exist or not, would provide a basis for a person skilled in the art to modify the processes of Ford and Huffer with any reasonable expectation of success. There is simply no evidence provided to substantiate the assumption that techniques suitable for **gas** (as opposed to liquid) fueled compression ignition engine are applicable to **liquid** fuel emulsion fueled engines, but for Applicants’ specification. For at least this reason, Beck does not cure the deficiency and, again, the rejection should be withdrawn.

Third, neither Ford, Huffer or Beck disclose a method comprising the step of reducing the pollution in the form of particulates. As stated above, the present

application has shown unexpected results with the claimed method for the reduction of particulates in Table 2 and as recited in claim 77. Hence, the proposed process step is non-obvious.

Accordingly, since Huffer in view of Ford and in further view of Beck, does not teach or suggest the claimed invention, the current rejection should be withdrawn.

**IV. CONCLUSION**

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

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Dated: December 2, 2010

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